

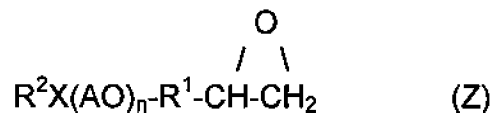
### Remarks

Claims 2-12 are currently pending in this application. Claim 1 has been cancelled.

Applicants respectfully request that the amendments be entered in the claims. Claims 2 and 3 have been amended to clearly indicate that the composition comprises the reaction product of a) with b).

New claims 4 and 5 have been entered in the application to claim the ranges for inclusion of the reaction product in the compositions. The limitations of claims 4 and 5 are supported at page 17, lines 12-15 and the limitations of claims 9, 10 and 12 are supported at page 26, lines 9-11. Claims 6-12 have been entered to claim the amounts of the reaction product in the composition, an amount of c) and the additives. The limitations in claim 6 are supported at page 21, lines 11-12. Claim 7 is supported at page 19, lines 9-26. Claim 8 is supported at page 20, line 1. Claim 11 is supported at page 38, lines 6-8.

Before discussing the rejections over the prior art, Applicants deem it prudent to set forth the nature of the base-catalyzed branched reaction product, particularly when  $R^1(X)_3$  is a halogenated epoxy compound such as epichlorohydrin. When the alkoxyated compound b) is reacted with the compound a), the first reaction which occurs is a reaction between the halogen atom on compound a) with the hydroxyl group of the compound b) to form a compound of the formula:

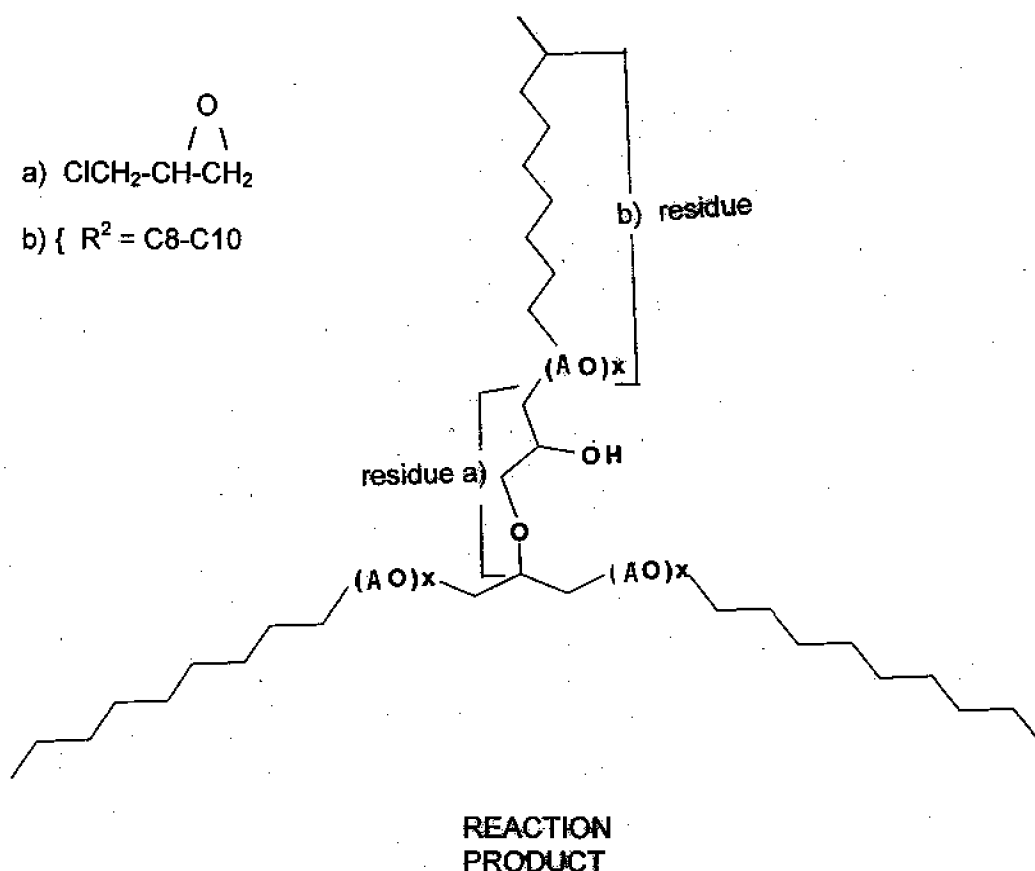


the compound (Z) is then reacted with compounds of the formula b) or with itself or with other epoxide compounds in the reaction mixture. The reaction of compound (Z) is dependent upon the equivalent ratio of OH groups in compound b) to the equivalent

number of chlorine atoms in compound a). If the ratio of the equivalents of OH groups in compound b) to the chlorine atoms in compound a) is greater than 1, there will be free OH groups to react with the epoxy groups in the compound (Z). The compound (Z) will then react with the free OH.

If the ratio of the OH groups in compound b) to the equivalent of chlorine atoms in compound a) is less than 1, there will be few OH groups for the epoxy groups in compound (Z) to react with and a portion of the epoxy groups in compound (Z) will react with the OH groups formed by the initial reaction and OH groups formed by hydrolysis of  $R^1(X)_3$  to extend the polymer chain.

As can be seen from the above description, the reaction product of a) with b) provides a complex mixture of branch chain oligomers of the structure.



As can be seen from the structure, and the claims as presently amended, it is clear that base-catalyzed branched reaction product is not  $R^2X(AO)_nY$ , but is the reaction product of a) with b) which provides a composition with the branched chain structure set out above. The branched chain structure can become even more complex if there is sufficient amount of unreacted a) to extend the chain from the unreacted OH group shown in the structure. This path could provide a structure with additional branches based on the unreacted OH group in the structure and any additional OH groups which may be formed between the reactants a) and b) with the branched chain structure shown. Applicants have presented the structure to clarify in the Examiner's mind the nature of the reaction product of the present invention.

Claim 3 stands rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention.

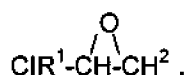
At page 4, the first paragraph, the Examiner states:

"Attention is drawn to formula (II), which represent the base catalyzed reaction product having the formula  $R^2X(AO)_nY$ , where  $R^2$  is a substituted or unsubstituted organic group. It is the Examiner's position that the recitation of "substituted organic group" is so broad that it clearly encompasses, for instance, a hydroxyl group containing organic moiety. Hence, formula (II) clearly encompasses a polyhydric alcohol. It appears that the Applicants is arguing that in order for the reaction product to not be epoxy functional, formula (II) must represent a monohydric alcohol (page 15, line 21, through page 16, line 3, of amendment filed 04/12/2006). As explained above, the is incorrect. Therefore, the new limitation of epoxy functional groups conflicts with the scope of formula (II) and renders the claim indefinite."

Applicants respectfully submit that formula (II) ( $R^2X(AO)_nY$ ) does not represent the based catalyzed reaction product. Formula (I) represents one of the reactants which is reacted with the compound of the formula (II) to form the reaction product. The reaction product is set forth in the simplified structure presented above.

The claims have been amended to indicate that the  $R^2$  group can be substituted

with alcohol functionality. As shown in the figure of the reaction product set forth above, the reaction product can contain hydroxyl functionality. In the discussion presented at page 15, line 21, through page 16, line 3, of the amendment filed 04/12/2006, Applicants attempted to make the distinction that the reaction product of the present invention did not contain free epoxy groups since the epoxy groups are reacted with the hydroxyl groups or are reacted with themselves to form the composition of the invention. That is, depending upon the ratio of compounds of the formula (I) to the compounds of the formula (II), the structure of the reaction product can change. However, the reaction product as shown in the figure presented above can have unreacted hydroxyl groups. The reaction product does not contain free epoxide groups. To simplify the structure of the reaction product to make it understandable, the figure above is formed by reaction of 1 mole of epichlorohydrin with 3 moles of compound b). If the starting composition contained more than 1 mole of epichlorohydrin to 3 moles of compound b), the additional epichlorohydrin would have reacted with the unreacted OH group shown in the reaction product structure. If less than 1 mole of epichlorohydrin were reacted with 3 moles of compound b), the reaction product would contain compounds of the structure set out above and in addition contain unreacted compounds b). Applicants submit that the number of hydroxyl groups in the compound b) determine the complexity of the reaction product depending upon the relationship of the number of equivalent of the hydroxyl groups to the moles of compound a) in the starting reaction mixture. That is, the reaction products would have free hydroxyl groups if the amount of equivalents of hydroxyl groups greater than a ratio of 3:1 to the compound of a). However, if the moles of compounds a) are greater than the equivalents of the hydroxyl groups by a ratio of 3:1, all of the hydroxyl groups would be reacted and the epoxide groups and the excess epoxide groups would react with free OH groups formed by hydrolysis of the



Therefore, Applicants respectfully submit that  $R^2$  in compound b) can be substituted with hydroxyl groups.

At column 8, lines 50-55 of Kaylo et al., Kaylo is discussing the preparation of epoxy functional materials which occurs in the formation of the reaction product of the present invention. That is, the halo group on the epichlorohydrin reacts with the hydroxyl group of the polyhydric alcohol to form an ether bond between the propylene oxide group and the backbone structure of the polyhydric alcohol. As long as an excess of the epichlorohydrin is provided in relation to the hydroxyl equivalents in the polyhydric alcohol, all of the hydroxyl groups would be replaced with epoxide groups. This is the general method by which epoxides are prepared. Applicants herewith submit pages 80 and 81 "Polymer Synthesis", Volume II, Stanley R. Sandler and Wolf Karo. These pages show the reaction of epichlorohydrin with a hydroxyl compound to form glycidyl compounds. However, the reaction scheme set forth in Kaylo at column 8, lines 50-55, shows reaction with an excess of epichlorohydrin so that all of the hydroxyl groups are substituted with the epoxy group. It is clear that if an insufficient amount of the epichlorohydrin was provided (less than an equivalent amount to the hydroxyl groups, there would be unreacted hydroxyl groups). The unreacted hydroxyl groups would react with the epoxide groups which have been substituted on the polyhydroxy compound to crosslink the materials or extend the chain. However, all of the hydroxyl groups would be reacted with the substituted epoxide groups in the polyhydroxy compound until either all of the hydroxyl groups had been reacted with the epoxide groups to provide free epoxy groups or all of the epoxide groups have been reacted with the hydroxyl group to provide a composition containing free hydroxyl groups. However, it would be clear that all of the hydroxyl groups would have been reacted or all of the epoxide groups had been reacted, depending upon which was in excess in the reaction mixture. Applicants respectfully submit that there is no conflict between the teachings of Kaylo et al. and the teachings of the present application in regard to the presence or absence of free epoxide groups.

It is clear that the composition of Kaylo is an epoxy resin which is reacted with epoxy-curing agents to cure the resin after its application to the substrate. The epoxy resin must have free epoxy groups to react with the curing agent. This is known epoxy chemistry and would be familiar to one skilled in the art.

As stated, the crosslinkers required to cure the epoxy resins useful in Kaylo et al. are set forth at column 9, beginning at line 53. These crosslinking agents are mixed with the resin and after the epoxy resin has been deposited on the substrate, the layer of the deposited resin is heated to react with the crosslinking agents to cure the epoxide.

Applicants respectfully submit that there is no conflict between the teachings of the present application and Kaylo et al. in regard to the functionality of the reaction products involved.

In view of the above discussion, Applicants respectfully request that the rejection of the claims under 35 U.S.C. 112, second paragraph, be reconsidered and withdrawn.

Claim 2 stands rejected under 35 U.S.C. 102(b) as anticipated by Wiggins et al. (U.S. 6,387,962). Applicants respectfully submit that Wiggins does not anticipate the present invention. As presently claimed, the composition of the invention is a lubricating composition. Claim 2 has been amended to indicate that when a metal is contacted with the composition of the invention, the metal is lubricated. Applicants respectfully submit that Wiggins et al. is directed to a defoamer and is completely silent concerning any lubricating activity for the composition shown or any suggestion that such a composition would be useful as a lubricant.

Applicants respectfully submit that to be a reference upon which a rejection under 35 U.S.C. 102(b) can be based, the reference must show each and every limitation in the claims. Applicants submit that Wiggins et al. fails as a reference as it neither teaches nor suggests that when the composition is applied to a metal, the metal is lubricated.

All of the examples in Wiggins et al. are directed to paint formulations which one

skilled in the art would understand does not provide lubrication when applied to a metal substrate and cured. Applicants therefore respectfully request reconsideration and withdrawal of the rejection over Wiggins et al.

Claim 3 stands rejected under 35 U.S.C. 102(b) as anticipated by Kaylo (U.S. 6,290,830). Applicants respectfully submit that Kaylo neither teaches nor suggests the present invention. Applicants respectfully submit that Kaylo does not anticipate the present invention. As discussed above, Kaylo requires that the epoxy resin contain free epoxide groups. This does not conflict with the present invention which composition does not contain free epoxy groups. The composition of the invention is a reaction product which has been prepared by a method which provides a composition without free epoxide groups. However, Kaylo utilizes an epoxy resin and a curing agent which crosslinks the epoxy resin to form a hardened resin coating. The Kaylo composition requires the free epoxy groups so that the resin can be crosslinked and hardened to form the useful coating composition. Applicants respectfully submit that Kaylo et al. neither teaches nor suggests the epoxy-free reaction product of the present invention and its use in an aqueous electro-plating composition. In view of the above discussion, Applicants respectfully request that the rejection of the claims over Kaylo et al. be reconsidered and withdrawn.

Claim 2 stands rejected under 35 U.S.C.103(a) as unpatentable over Larsen (U.S. 2,375,007) in view of Dones et al. (U.S. 6,540,942). Applicants respectfully submit that Larsen and Dones, whether considered alone or in combination, neither teach nor suggest the present invention.

Larsen is directed to a silicon anti-foam agent for aircraft lubricating oils. The only pertinence Larsen has to the present invention is the teaching that lubricating oil compositions have foaming problems. The anti-foaming silicone compounds useful in the Larsen composition are not related in any manner to the reaction product of the present invention.

The deficiencies in the teaching of Larsen are not cured by combination with

Dones. Dones is directed to the use of a reaction product similar to the reaction product of the present invention as a defoaming agent in a non-aqueous resin coating system. A number of other useful nonaqueous systems are set forth at column 4, lines 1-4. However, none of the suggested nonaqueous compositions comprise a lubricating oil. Applicants respectfully submit that there is neither teaching nor suggestion that the composition disclosed in Dones would be useful as anti-foam agent in a lubricating composition. Larsen teaches that lubricating compositions can have foaming problems. However, there is neither teaching nor suggestion that the anti-foam agents disclosed in Dones would have any utility as an anti-foam agent in a lubricating oil. Applicants respectfully submit that there is no connection between the teaching of Dones and the teaching of Larsen and a rejection based on the combination of references is untenable. Applicants respectfully request that the rejection be reconsidered and withdrawn.

The only connection between the teachings of Larsen and Dones is the present application. To connect the two references is hindsight reconstruction of Applicants' invention and is not a proper grounds under which a rejection under 35 U.S.C. 103(a) can be based.

Claim 3 stands rejected under 35 U.S.C. 103(a) as unpatentable over Kaylo (U.S. 6,290,830) in view of Dones (U.S. 6,540,942) and Deresh (U.S. 4,849,059). Applicants respectfully submit that Kaylo, Dones and Deresh, whether considered alone or in combination neither teach nor suggest the present invention.

Applicants respectfully submit that the rejection is flawed since Kaylo neither teaches nor suggests an electroplating composition.

At column 1, lines 15-20, Kaylo discloses that electrodeposition and electrophoretic deposition have advantages for applying corrosion-resistant coatings in automotive applications. As is well understood in the art, electrodeposition and electrophoretic coatings are used to describe the same process and the process is not an electroplating process.



As set forth at page 27, lines 4-10, the present application teaches:

"The essential components of an electroplating process are an electrode to be plated (the cathode); a second electrode to complete the circuit (the anode); an electrolyte containing the metal ions to be deposited; and a d-c power source. The electrodes are immersed in the electrolyte such that the anode is connected to the positive leg of the power supply and the cathode to the negative. As the current is increased from 0, a minimum point is reached where metal plating begins to take place at the cathode." (Emphasis added by Applicant).

As clearly set forth, an electroplating process requires the presence of an electrolyte containing the metal ions to be deposited. In contrast to the electroplating process, there are no metal ions in the Kaylo et al. electrodeposition bath which are deposited on the cathode. At column 2, lines 8-10, Kaylo teaches:

"The presence of metal ions of these salts in electrodeposition systems is undesirable because the metals cause coating defects such as gas generation at the cathode. "

Applicants herewith submit page 689 from McGraw Hill, Concise Encyclopedia of Science and Technology, Fourth Edition, which has a brief description of electrophoretic deposition and teaches that the processes useful in the electropainting, for instance electropainting of automobile bodies and other objects have now been adopted in a large scale.

In addition, Kaylo at column 10, lines 59-65, teaches:

"Preferably the electrodepositable coating composition is essentially free of metallic materials. "Essentially free of metallic materials" means that the electrodepositable coating composition contains no additional water-soluble inert ingredients in the form of metallic materials, for example metal salts such as magnesium chloride, magnesium nitrate or copper nitrate. " (Emphasis added by Applicant).

Applicants respectfully submit that in view of the teachings of Kaylo that the electrodeposition or electrophoretic bath does not contain soluble metal ions, the process is not or cannot be an electroplating process which requires that the metal to be plated is in the form of an ionic solution which is deposited on the cathode. The

Examiner points out that the examples in the coating composition disclosed in Kaylo contains lead. Applicants submit that the composition would be a typically leaded paint in which the lead is present as an insoluble material encapsulated in the resin which forms the film.

The process disclosed in Kaylo in the examples would not deposit a film of lead on the cathode.

Applicants have reviewed the solubility of lead compounds and most of the inorganic lead compounds are insoluble in water with the exception of lead nitrate. Applicants respectfully submit that it would be clear to one skilled in the art that the Kaylo process is not an electroplating process, but is a process which moves charged solid particles through a liquid vehicle for deposition on an electrode. Applicants therefore respectfully submit that Kaylo would neither teach nor suggest an electroplating process containing the reaction product of the present invention.

In the rejection, the Examiner has mis-characterized the teachings of Dones. Dones discloses a non-aqueous composition comprising at least one reaction product which is similar to the reaction product of the present invention. The Dones' composition comprising a non-aqueous composition which produces hard coatings which contains additives. The composition disclosed in Dones which is similar to the composition of the present invention, can be added to the non-aqueous hard coating composition to provide a coating which when cured has few surface defects. In contrast to the non-aqueous composition disclosed in Dones, the electroplating composition of the present invention is an aqueous electroplating composition which bears no relation to the non-aqueous compositions disclosed in Dones. Since Kaylo teaches a process and a composition which is not an electroplating composition, and Dones is directed to a non-aqueous composition, Applicants respectfully submit that the combination of Kaylo with Dones neither teaches nor suggests the present invention.

The deficiencies in the teachings of Kaylo in view of Dones, are not cured by combination with Deresh. Deresh discloses a tin, lead, or tin-lead alloy electroplating

bath producing little or no foam during electroplating containing a defoaming agent comprised of silicone and silica and/or a silicate. However, the electroplating bath disclosed in Deresh is an aqueous, acidic electroplating bath containing ions of tin, lead, or tin and lead which is to be plated. The electroplating bath of Deresh contains a defoaming agent comprised of a mixture of silicone and either silica and/or silicate in polypropylene glycol solution. Applicants submit that there is neither teaching nor suggestion that the reaction mixture of the present invention would have any anti-foaming activity in the electroplating bath of Deresh.

The combination of Kaylo, Dones and Deresh is improper since there is no relation which one skilled in the art would understand from the combination of the three patents. Kaylo, as set forth above, discloses an electrodeposition or electrophoretic process which utilizes an electrodeposition bath which does not contain metal ions. Dones is not properly combinable with Kaylo since Dones is directed to a non-aqueous composition which is a non-aqueous resin composition containing an anti-foam agent similar to the reaction product of the present invention. Deresh bears no relation to the teachings of Kaylo or Dones in that Deresh is directed to an electroplating process which requires the presence of a silicon or silica-containing anti-foam agent. Applicants respectfully submit that there would be neither teaching nor suggestion to utilize the anti-foam agent disclosed in Dones in the electroplating bath of Deresh. Kaylo makes no mention of the need for an anti-foam agent of any type, and evidently the process does not require such an anti-foam agent due to the nature of the electro-deposition composition. Applicants respectfully submit that the only connection between the three references is the present application. Applicants submit that the Examiner has developed the rejection on the basis of hindsight reconstruction of Applicants' invention. Hindsight reconstruction is not a proper grounds under which a rejection under 35 U.S.C. 103(a) can be based. Applicants respectfully request that the rejection of claim 3 over the combination of Kaylo with Dones and Deresh be reconsidered and withdrawn.

Claim 3 stands rejected under 35 U.S.C. 103(a) as unpatentable over Kaylo in view of Gross (U.S. 6,532,973). and Deresh. Applicants respectfully submit that Kaylo, Gross and Deresh, whether considered alone or in combination neither teach nor suggest the present invention. As discussed above in relation to the rejection over Kaylo, Dones and Deresh, the electrophoretic or electrodeposition process and bath disclosed in Kaylo is not an electroplating bath since it does not contain ions of a metal being plated. In fact, as pointed out above, Kaylo teaches that metal ions in the electrodeposition bath are detrimental to the formation of a suitable coating of the paint being applied.

The deficiencies in Kaylo are not cured by combination with Gross. Gross is directed to use of a reaction product similar to the reaction product of the present invention as a gloss retention and detergent improving composition for surfactant compositions. There is neither teaching nor suggestion that the reaction product disclosed in Gross would have any utility as an anti-foaming agent in an electroplating bath composition.

The deficiencies in the combination of Kaylo with Gross are not cured by combination with Deresh. Deresh discloses a tin, lead or tin-lead oil electroplating bath containing a defoaming agent comprised of silicon and silica or a silicate in polypropylene glycol. The defoaming agent disclosed in Deresh bears no relation to the reaction product anti-foaming agent useful in the electroplating process of the present invention. Applicants respectfully submit that the combination of references neither teaches nor suggests the present invention since Kaylo is not related to an electroplating bath or an electroplating process and, in addition, the process disclosed in Kaylo does not require the presence of an anti-foaming agent. Apparently, the electrodeposition process or the electrophoretic process disclosed in Kaylo is not a foam prone composition and nowhere in the reference is the use of an anti-foaming agent mentioned or suggested.

The deficiencies in Kaylo are not cured by combination with Gross since Gross is


directed to a gloss-retention additive for cleaning composition which would not teach or suggest the use as an anti-foam agent in an electroplating process.

As pointed out above, Deresh does not cure the deficiencies in the combination of Kaylo with Gross since Deresh is directed to an electroplating bath which utilizes an anti-foaming agent which bears no relation to the reaction product useful in the practice of the present invention. Applicants therefore respectfully submit that the combination of references neither teaches nor suggest the present invention and a rejection based thereon is untenable. Applicants therefore respectfully request that the rejection be reconsidered and withdrawn.

In view of the nature of the reaction products described above and the discussion concerning the various rejections over a broad range of references, Applicants respectfully submit that the applicants is in condition for allowance and favorable consideration is requested.

Respectfully submitted,

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- Enc.: 1. Pages 80 and 81, "Polymer Synthesis, Volume II  
2. Page 689, McGraw Hill, Concise Encyclopedia of Science and Technology, Fourth Edition